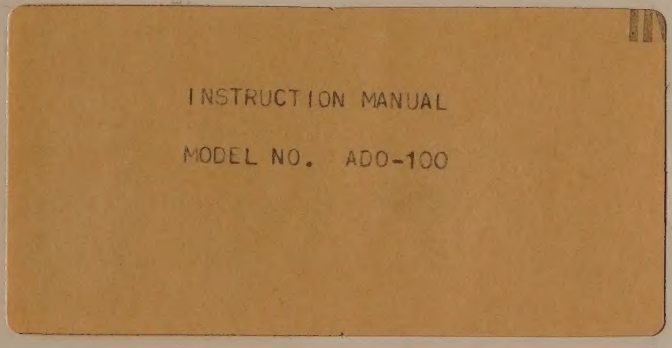

Instruction Manual

INSTRUMENT
CENTER

elin DIVISION

INTERNATIONAL ELECTRONIC RESEARCH CORPORATION
BURBANK, CALIFORNIA

INSTRUMENT
CENTER

INSTRUCTION MANUAL

MODEL NO. ADD-100

WARRANTY

ĒLIN DIVISION OF INTERNATIONAL ELECTRONIC RESEARCH CORPORATION WARRANTS EACH INSTRUMENT MANUFACTURED BY THEM TO BE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF ORIGINAL SHIPMENT. OUR LIABILITY UNDER THIS WARRANTY IS LIMITED TO SERVICING OR ADJUSTING ANY INSTRUMENT RETURNED TO THE FACTORY FOR THAT PURPOSE AND TO REPLACE ANY DEFECTIVE PARTS, EXCEPT VACUUM TUBES, AT NO CHARGE. THIS WARRANTY APPLIES ONLY TO INSTRUMENTS THAT HAVE BEEN RETURNED TO US AND WHICH, UPON OUR EXAMINATION, HAVE BEEN DISCLOSED TO OUR SATISFACTION TO BE DEFECTIVE.

NO INSTRUMENT IS TO BE RETURNED WITHOUT PRIOR APPROVAL FROM ĒLIN DIVISION OF INTERNATIONAL ELECTRONIC RESEARCH CORPORATION, AND THEN MUST BE RETURNED WITH TRANSPORTATION CHARGES PREPAID. IF THE FAULT HAS BEEN CAUSED BY MISUSE OR ABNORMAL CONDITIONS OF OPERATION, REPAIRS WILL BE BILLED AT COST. IN THAT CASE, AN ESTIMATE WILL BE SUBMITTED BEFORE THE WORK IS STARTED.

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SPECIFICATIONS - MODEL ADD-100

FREQUENCY RANGE:	10 CYCLES TO 100 KC IN FOUR DECADE RANGES
CALIBRATION ACCURACY:	± 1% AT 25° C WITH THE FINE FREQUENCY VERNIER CENTERED. (ADJUSTABLE ± 2% BY THE FINE FREQUENCY VERNIER)
FREQUENCY STABILITY:	LESS THAN 0.02% PER DEGREE C, 15° TO 45° C
FREQUENCY RESPONSE:	LESS THAN ± 0.25 DB OVER MOST OF THE RANGE, RISING TO ± 1DB AT THE EXTREMES. (REFERENCE - 1 KC)
OUTPUT VOLTAGE:	1V INTO 600 OHMS (ADJ. ± 40%) 2V APPROX. - OPEN CIRCUIT
AMPLITUDE STABILITY:	LESS THAN 0.01% SHORT TERM WHEN USED IN CONJUNCTION WITH THE HOLT MODEL AVS 321 VOLTAGE CALIBRATOR
TOTAL HARMONIC DISTORTION:	LESS THAN 0.1% OVER MOST OF THE RANGE, INCREASING BELOW 100 CPS
HUM AND NOISE:	LESS THAN 0.02%

LINE: 105V TO 125V

INPUT POWER: 40 W MAX.

A86258

SECTION 1 GENERAL DESCRIPTION

1.0 INTRODUCTION

THE NEW ADO-100 UTILIZES THE LATEST ENGINEERING DEVELOPMENTS INTEGRATED WITH ESTABLISHED TECHNIQUES, TO PROVIDE THE ULTIMATE IN AN AUDIO SIGNAL GENERATOR.

THIS INSTRUMENT COMBINES SIMPLICITY OF OPERATION WITH A NEW AND SOPHISTICATED APPROACH TO THE GENERATION OF AC SIGNALS. THE UTILIZATION OF ĒLIN'S UNIQUE SOLID-STATE REGULATOR IN A TIME-HONORED WIEN BRIDGE OSCILLATOR CIRCUIT PROVIDES AN ULTRA STABLE, LOW DISTORTION AC SIGNAL.

THESE FEATURES, COMBINED WITH A SIMPLICITY OF OPERATION DUE TO DIRECT READOUT, MAKE THE ADO-100 AN IDEAL DRIVER FOR THE HOLT MODEL AVS 321 VOLTAGE STANDARD.

1.1 UNPACKING AND MECHANICAL INSPECTION

INSPECT INSTRUMENT FOR SHIPPING DAMAGE AS SOON AS IT IS UNPACKED. VISUALLY INSPECT THE INSTRUMENT FOR BROKEN KNOBS, CONNECTORS OR ANY OTHER SIGNS OF PHYSICAL DAMAGE. ROTATE CONTROLS AND SWITCHES FOR SMOOTHNESS OF OPERATION. BINDING OR JAMMING INDICATES DEFECTIVE MECHANICAL OPERATION. IF A CONTROL IS FOUND THAT DOES NOT TURN FREELY, DO NOT FORCE IT FOR SUCH ACTION MAY CAUSE SERIOUS DAMAGE. UPON SATISFACTORY VISUAL INSPECTION, CHECK THE ELECTRICAL PERFORMANCE OF THE INSTRUMENT. IF INSTRUMENT IS DEFECTIVE, SEE THE WARRANTY ON PAGE 1.

1.2 ELECTRICAL CONNECTIONS

THE NATIONAL ELECTRICAL MANUFACTURERS' ASSOCIATION (NEMA) RECOMMENDS THAT THE INSTRUMENT PANEL AND ITS CASE BE GROUNDED FOR SAFETY OF OPERATION. ALL ĒLIN INSTRUMENTS ARE EQUIPPED WITH A THREE-CONDUCTOR POWER CABLE WHICH WHEN PLUGGED INTO AN APPROPRIATE RECEPTACLE GROUNDS THE INSTRUMENT. THE GROUND PIN ON THE POWER CABLE THREE-PRONG CONNECTOR IS THE OFFSET ROUND PIN. WHEN OPERATING THE INSTRUMENT FROM A TWO-CONTACT OUTLET, USE A THREE-PRONG TO TWO-PRONG ADAPTER AND CONNECT THE GREEN PIGTAIL ON THE ADAPTER TO GROUND.

SECTION 2 OPERATING INSTRUCTIONS

2.0 CONTROLS

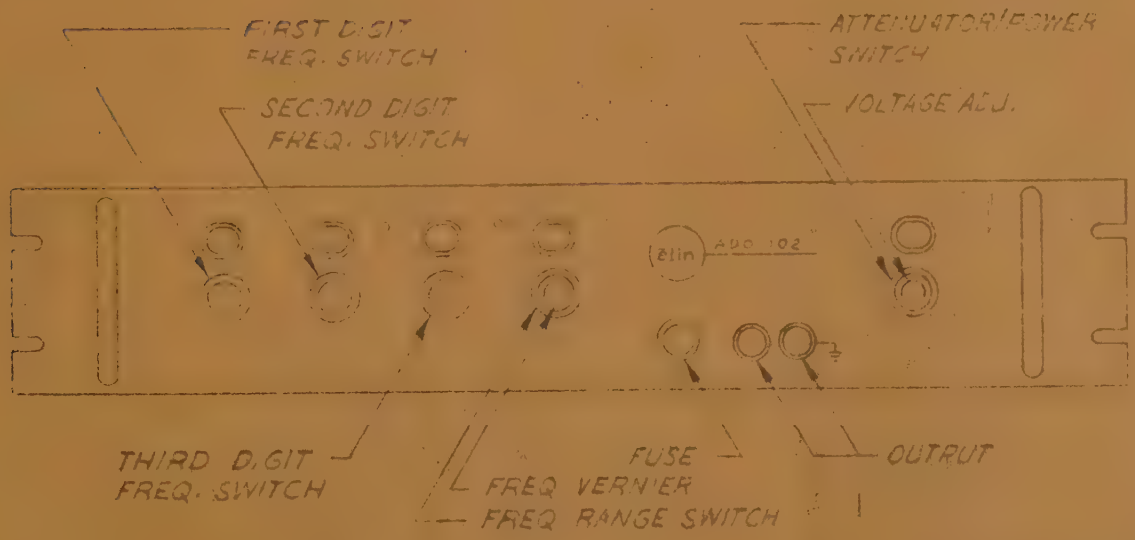
2.0.1 POWER SWITCH - TURNS INSTRUMENT ON AND OFF.

2.0.2 VOLTAGE ADJUST - ADJUSTS VOLTAGE LEVEL

2.0.3 Frequency Range Switch - Selects frequency range.

2.0.4 Frequency Vernier - Fine frequency adjust. This control will vary the set frequency approximately ± 2%.

2.0.5 First Digit Frequency Switch
2.0.6 Second Digit Frequency Switch
2.0.7 Third Digit Frequency Switch
} Selects frequency of operation.



2.1 GENERAL OPERATING INFORMATION

2.1.1 INPUT POWER - TO INSURE MAXIMUM STABILITY, THE ADO-100 CONTAINS AN ELECTRONICALLY REGULATED POWER SUPPLY. THE LINE VOLTAGE MAY VARY BETWEEN 105 AND 125 VOLTS WITHOUT NOTICEABLY AFFECTING THE PERFORMANCE OF THIS INSTRUMENT.

2.1.2 OUTPUT - THE OUTPUT OF THE ADO-100 APPEARS ACROSS THE BINDING POSTS ON THE FRONT PANEL. ON INSTRUMENTS SUPPLIED WITH AN OUTPUT CONNECTOR ON THE REAR, THE CONNECTOR IS A STANDARD BNC TYPE. THE OUTPUT OF THE ADO-100 IS SINGLE-ENDED AND MUST ALWAYS BE OPERATED AS SUCH. DO NOT CONNECT THE OUTPUT OF THIS INSTRUMENT ACROSS A DC POTENTIAL OF MORE THAN A FEW VOLTS WITHOUT USE OF A BLOCKING DEVICE, FOR SERIOUS DAMAGE CAN OCCUR.

SECTION 3 THEORY OF OPERATION

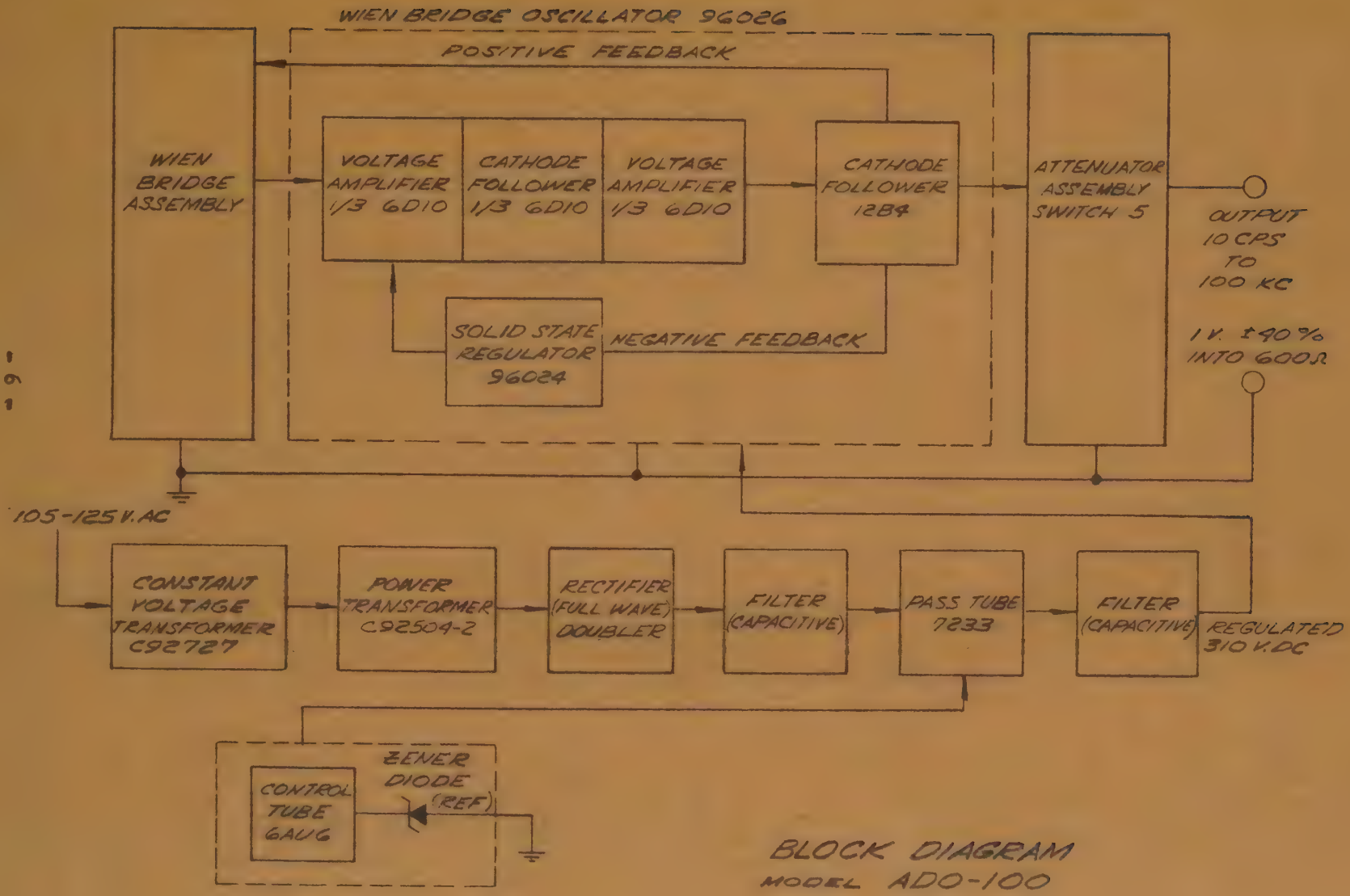
3.0 WIEN BRIDGE OSCILLATOR ELIN ASSY. 96026

THE OSCILLATOR SECTION OF THE ADO-100 IS A CAPACITANCE-RESISTANCE TUNED WIEN BRIDGE CIRCUIT. PRECISION METAL FILM RESISTORS AND ULTRA-STABLE POLYSTYRENE CAPACITORS ARE USED IN THE TUNING CIRCUITS TO INSURE STABLE OPERATION.

REFERRING TO THE BLOCK DIAGRAM, BELOW, A "COMPACTRON" 6D10 AND A 1284 MAKE UP THE TUBE COMPLIMENT OF THE OSCILLATOR. THE "SOLID STATE REGULATOR", ELIN PART NO. 96024, IS USED TO KEEP THE OSCILLATOR VOLTAGE CONSTANT AT APPROXIMATELY THIRTY VOLTS. THIS REGULATOR SERVES THE SAME FUNCTION AS A LAMP WITHOUT THE INHERENT MECHANICAL INSTABILITY ASSOCIATED WITH LAMP STABILIZATION.

3.1 POWER SUPPLY

THE POWER SUPPLY SECTION OF THE ADO-100 CONSISTS OF A FULL-WAVE VOLTAGE DOUBLER DC SUPPLY AND AN ELECTRONIC REGULATOR. THE ELECTRONIC REGULATOR IS MADE UP OF A 7233 PASS-TUBE AND A ZENER DIODE REFERENCED CONTROL UNIT, ELIN ASSY. 96027. USE OF A REGULATED B+ VOLTAGE MINIMIZES THE EFFECTS OF LINE VARIATIONS ON THE INSTRUMENT. A CONSTANT VOLTAGE TRANSFORMER FURTHER INSURES STABLE OPERATION OF THE ADO-100.



BLOCK DIAGRAM
MODEL ADO-100

SECTION 4 MAINTENANCE AND TROUBLE SHOOTING INFORMATION

4.0 GENERAL INFORMATION

4.0.1 MAINTANANCE ON THE ADO-100 SHOULD BE VERY LIMITED DUE TO CONSERVATIVE RATING OF COMPONENTS AND USE OF THE IERC HEAT DISSIPATING TUBE SHIELDS; HOWEVER, SHOULD FAILURE OCCUR, A SYSTEMATIC APPROACH TO THE PROBLEM CAN BE FOLLOWED. THE TROUBLE SHOOTING INFORMATION PRESENTED IN THIS SECTION IS FOR THE USE OF PERSONNEL THOROUGHLY VERSED IN TROUBLE SHOOTING PROCEDURES AND THE CIRCUIT THEORY GIVEN IN SECTION 3.

4.0.2 THE FUSE LOCATED ON THE FRONT PANEL SHOULD BE CHECKED.

4.0.3 ALTERNATING CURRENT SUPPLIED TO THE POWER TRANSFORMER SHOULD BE MEASURED TO INSURE THAT THE INPUT VOLTAGE IS WITHIN THE RANGE OF 105 TO 125V RMS, 60 CPS.

4.0.4 THE TUBES SHOULD BE CHECKED BY DIRECT SUBSTITUTION.

4.0.5 D.C. VOLTAGE MEASUREMENTS SHOULD BE MADE TO DETERMINE IF ALL VOLTAGES ARE CORRECT. THE PERTINENT VOLTAGES ARE MARKED ON THE SCHEMATIC. IT IS NORMAL FOR THESE VOLTAGES TO VARY ± 20% FROM THE DESIGNATED VALUE. ALL MEASUREMENTS SHOULD BE MADE WITH A VACUUM TUBE VOLTMETER.

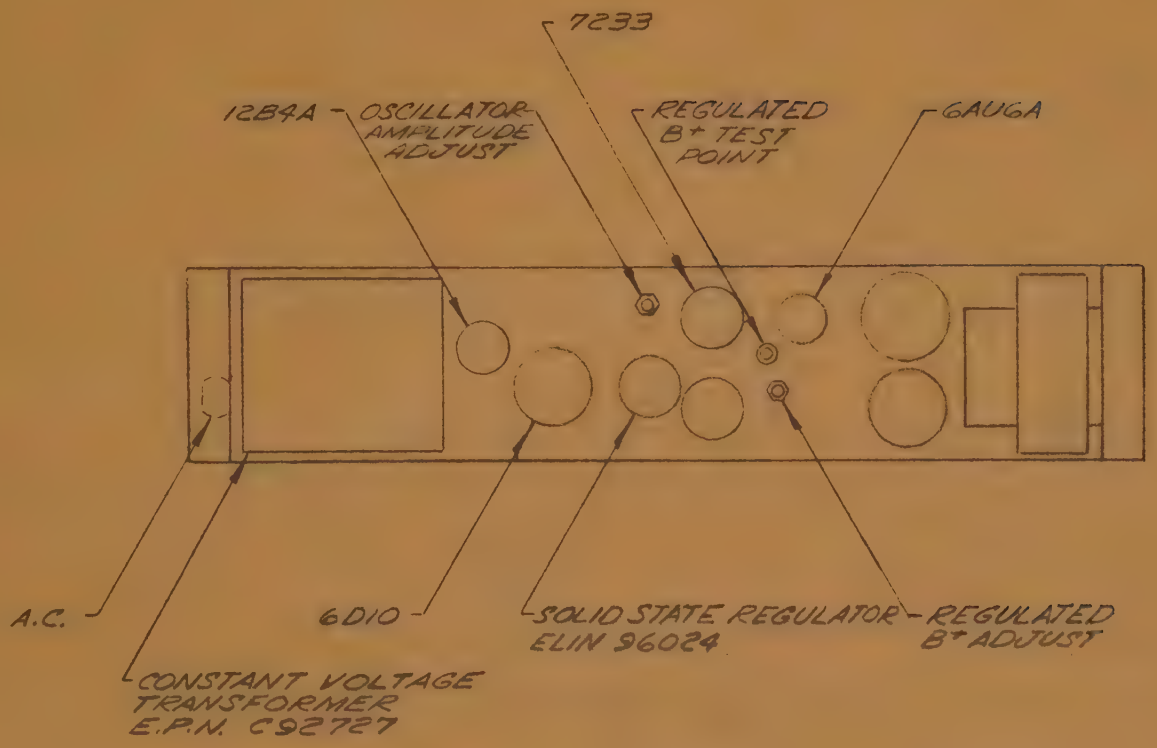
4.0.6 STANDARD SIGNAL TRACING PROCEDURES CAN BE USED WITH THIS INSTRUMENT. USE A SCOPE WITH A HIGH IMPEDANCE PROBE TO PREVENT SIGNAL LOADING.

4.0.7 DISTORTION MAY BE MEASURED WITH AN INSTRUMENT WHICH DIRECTLY INDICATES PERCENTAGE OF TOTAL HARMONIC DISTORTION, SUCH AS A HEWLETT-PACKARD MODEL 330B.

4.1 CALIBRATION

ALLOW APPROXIMATELY ONE HOUR WARM-UP BEFORE CHECKING FREQUENCY CALIBRATION. THE FINE FREQUENCY VERNIER SHOULD BE CENTERED SINCE ITS RANGE IS ± 2% OF THE SET FREQUENCY. THERE ARE NO ADJUSTMENTS SINCE THE COMPONENT PARAMETERS MORE THAN INSURE ACCURATE CALIBRATION.

TUBE & ADJUSTMENT LOCATION DRAWING



REAR VIEW WITH COVER REMOVED

SCHEMATIC B77258 — R & C LIST - MODEL ADO-100

SYMBOL	DESCRIPTION	PART NO.
	TRANSFORMERS	
T-1	POWER	C92504-2
T-2	CONSTANT VOLTAGE	C92727
	TUBE	
V-1	ELECTRON	7233
	CAPACITORS	
C-4,5	ELECTROLYTIC, 260 UF @ 300V DC	21041
C-7A	" 35 UF @ 400V DC	21046
	&100 UF @ 50V DC	
	RECTIFIER	
CR-1A,1B	SILICON, 600 PIV 750MA	38500
	RESISTOR	
R-8,9	CARBON COMP., 47K 2W 5%	7302-473-5
F-1	FUSE, 1A SLO-BLOW	45001
	OSCILLATOR, WIEN BRIDGE	C96026
	TUBES & REGULATOR	
V-1	ELECTRON	6D10
V-2	ELECTRON	12B4A
VR-1	SOLID STATE	C96024A
	CAPACITORS	
C-1	ELECTROLYTIC, 40 UF @ 250V	21063
C-4	MYLAR , .47 UF @ 200V 20%	2222-474-20A
C-2	MYLAR , .01 UF @ 400V 10%	2224-103-10A
C-3	DISC CERAMIC, [illegible] PF @ 500V 5%	2285-681-5A
	RESISTORS	
R-12	CARBON COMP., 1.5K 1/2W 10%	7300.5-152-10
R-11	" , [illegible]K " "	7300.5-472-10
R-8	" , [illegible]2K " "	7300.5-823-10
R-1,13	" , [illegible]K " "	7300.5-274-10
R-9	" , 1.[illegible]M " "	7300.5-155-10
R-10	" , [illegible].[illegible]M " "	7300.5-225-10
R-14	" , [illegible].[illegible]M " "	7300.5-[illegible]35-10
R-7	" , [illegible]1K 1W "	7301-273-10
R-15	" , [illegible]K 2W "	7302-243-10
R-3	DEP. CARBON, [illegible].27K 1/2W 1%	7310.5-2371-1
R-6	" , [illegible].[illegible]3K " "	7310.5-3481-1
R-2	" , [illegible].13K " "	7310.5-6191-1
R-5	POT , [illegible].5K 1/2W	7370.5-252-MUA

SYMBOL	DESCRIPTION	PART NO.
	CONTROL UNIT, DC	C96027-1
V-1	TUBE, ELECTRON	6AU6A
Z-1	DIODE, ZENER	38026
C-1	CAPACITOR, MYLAR .047 UF @ 400V 10%	2224-473-10A
	RESISTORS	
R-1	CARBON COMP., 680K 1/2W 10	7300.5-684-10
R-2,3	" , 22K 1W "	7301-223-10
R-5	DEP. CARBON, 221K 1/2W 1%	7310.5-2213-1
R-4	" , 681K " 1%	7310.5-6813-1
R-6	POT , 250K	7270.5-254-10A
	RANGE SWITCH ASSEMBLY	96047
	CAPACITORS	
C-1C,2C	POLYSTYRENE, 5300 PF @ 200V 1/2%	2252-532-0.5B
C-1D,2D	" , 500 PF @ 200V 1%	2252-501-1A
C-1A,2A	" , .528 UF @ 200V 1/2%	22505
C-1B,2B	" , .053 UF @ 200V	22506
	RESISTOR	
R-3	METAL FILM, 29.2K 1/2W 1/2%	7320.5-29261-0.5
	1ST. DECADE SWITCH	96049
	RESISTORS	
	METAL FILM, 7.38K 1/2W 1/2%	7320.5-7381-0.5
	" , 9.75K " "	7320.5-9751-0.5
	" , 14.8 K " "	7320.5-1482-0.5
	" 30K " "	7320.5-303-0.5
	2ND. DECADE SWITCH	96050
	RESISTORS	
	DEP. CARBON, 73.2K 1/2W 1%	7310.5-7322-1
	" , 97.6K " "	7310.5-9762-1
	" , 147K " "	7310.5-1473-1
	" , 301K " "	7310.5-3013-1
	3RD. DECADE SWITCH	96051
	RESISTORS	
	DEP. CARBON, .75M 1/2W 1	7310.5-754-1
	" 1M " "	7310.5-105-1
	" 1.5M " "	7310.5-155-1
	" 3M " "	7310.5-305-1
	ATTENUATOR SWITCH	96052
	RESISTORS	
R-17	CARBON COMP., 2K 1W 5%	7301.5-202-5
R-16	" , 10K 1/2W 10%	7300.5-103-10
R-15	WIRE WOUND, 400 Ω 2W	7343-401
R-14	" , 10K 5W 3%	7345-103-3

B 77258 B

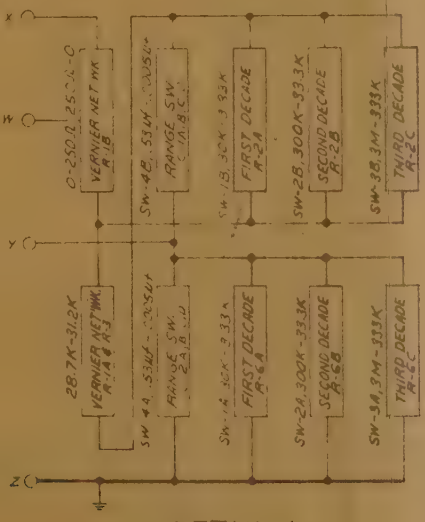
A	T.E. No. 927-2 (CN 324)		DCR V1
B	ADDED R-17. SEE C.N. 347 I.O.R	26 NOV 62	WP

+ 20

TROL

C-2 260 uf/300 V

0-2V OPEN CIRCUIT



DETAIL A

	I.O.R	9-12-	SCHEMATIC
			40 - 100

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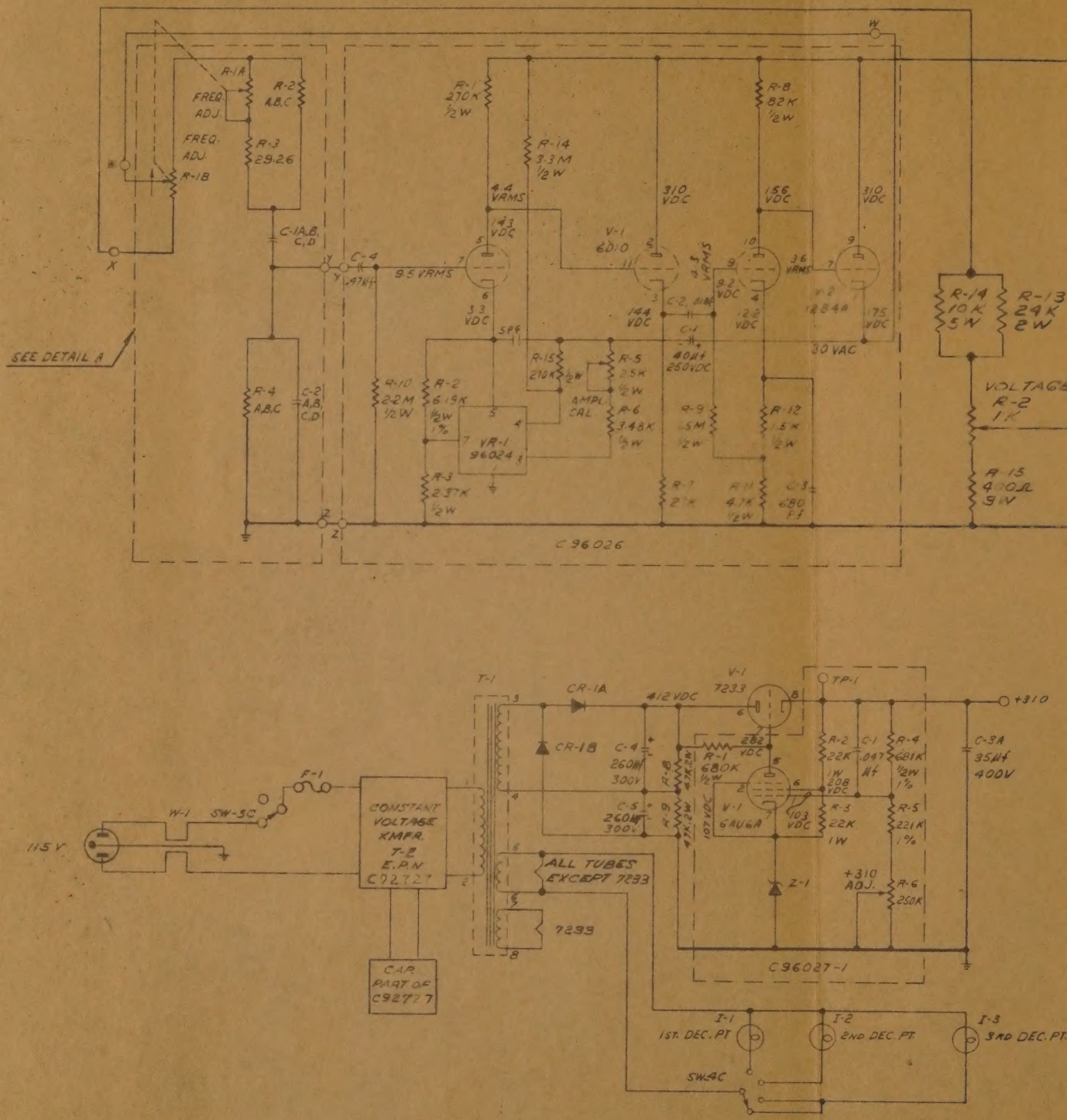
BURBANK CALIFORNIA U.S.A.

SIZE H | DWG NO 77258 | REV B



1. ALL VOLTAGES ARE ±20% & WERE MEASURED WITH A VTVM UNDER THE FOLLOWING CONDITIONS:
(a) LINE 115 VAC 60 ~ (b) E_{out} 2V @ 1KC

OTES UNLESS OTHERWISE SPECIFIED

INSTRUMENT
CENTER